

**Numerical Analysis Maple Project 1**  
Due September 11, 2002

**Instructions:** Use a word processor to create a text file with the four Maple procedures described below. All procedures should use type checking. Read the file into Maple and test each procedure with the values stated below. Turn in the following:

- 1). A hard copy showing only your reading in the text file and testing the procedures.
- 2). An email message with your text file attached so that I can test your procedures.

1. Find your name in the table below and write the given Maple procedure. (Use type checking where appropriate). Test your procedure for the values  $n = -5, 1, 10,$  and  $17.$

Name	Description
Sharon Melisha	Find the sum of all even integers between 1 and $n$ for positive integers $n \geq 1.$
Chris Elizabeth	Find the sum of all odd integers between 1 and $n$ for positive integers $n \geq 1.$
Gina	Find the product of all multiples of 3 between 1 and $n$ for positive integers $n \geq 1.$

2. Write a procedure that has a list of numbers as its input and outputs that maximum number in that list. Test the procedure using the list  $[1, 2, -3, 30, -2, 100].$
3. Given that  $e = \sum_{k=0}^{\infty} \frac{1}{k!},$  write a procedure using the for-while statement to evaluate the first partial sum

$$s_n = \sum_{k=0}^n \frac{1}{k!}$$

for which  $|s_n - e| < 10^{-N},$  where  $N \geq 1$  is a positive integer. Test your procedure for  $N = 1$  and  $N = 5.$  Note:  $e = \exp(1).$

4. Modify the procedure from problem 3 using the relative error condition  $\frac{|s_n - e|}{e} < 10^{-N}$  as the stopping criterion. Test your procedure for  $N = 1$  and  $N = 5.$